REMARKS

I. Introduction

Receipt is acknowledged of a final office action dated June 23, 2004. In the action, claims 3-7, 9, 11 and 63-66 were rejected as allegedly not enabled, failing to meet the written description requirement, indefinite, and lacking utility. The claims were also rejected under the judicially created doctrine of double patenting, which is being held in abeyance until there is an indication of allowable subject matter.

In view of the arguments detailed below, applicants respectfully request reconsideration of this application.

II. Status of the Claims

In this response no claims have been amended and no new claims have been added. Upon entry of this amendment, claims 3-7, 9, 11 and 63-66 will be under examination.

Because the foregoing amendments do not introduce new matter, entry thereof by the Examiner is respectfully requested.

III. Rejection of the Claims Under 35 U.S.C. § 112, first paragraph

A. Written Description Rejection

Claims 3-7, 9, 11 and 63-66 were rejected under 35 U.S.C. § 112, first paragraph because "[t]he specification does not contain any disclosure or description of the structure and function of all DNA sequences that are 95% identical to SEQ ID NO: 3, or DNA that encode polypeptide(s) that [are] 95% identical to SEQ ID NO: 1 or use [of] such a DNA in the method of making polypeptide(s) that [are] 95% identical to SEQ ID NO: 1." Office action at 3. The claims were further rejected because the specification "does not describe specific assays to measure the various polypeptide sequences having the 'detoxification activity.'" *Id.* Applicants respectfully disagree.

The specification describes both the structure and function of the claimed sequences. Foremost, the claims recite that the polynucleotides of the present invention encode an amino acid sequence that has at least 95% identity to SEQ ID NO: 1 ***and*** has detoxification activity. Furthermore, Table 2 of the present specification discloses potential phosphorylation and glycosylation sites, as well as signature sequences, motifs, and/or domains. Therefore, one of skill in the art would recognize the relevance of these regions and would know how to modify SEQ ID NO: 1 so as to make a sequence that shares at least 95% sequence identity to SEQ ID NO: 1 and has detoxification activity.

Furthermore, the specification provides a table of various conservative amino acid substitutions that could be made to a given sequence and are predicted to least interfere with the properties of SEQ ID NO: 1. Specification at 10-11. The specification also discloses an assay that correlates with DETX activity and an example assessing DETX function. Specification at Examples XI and XII. Accordingly, polypeptides that share at least 95% sequence identity (and therefore DNA sequences that encode them) with detoxification activity are adequately described in the present application. Thus, withdrawal of this ground for rejection is therefore courteously requested.

B. Enablement Rejection

Claims 3-7, 9, 11 and 63-66 were rejected under 35 U.S.C. § 112, first paragraph, allegedly for non-enablement. In particular, the claims were rejected because the specification "does not reasonably provide enablement for any polynucleotide having 95% identity to SEQ ID NO: 3 or a polynucleotide encoding a polypeptide having at least 95% sequence identity to the amino acid sequence of SEQ ID NO: 1." Office action at 5.

Applicants respectfully traverse this ground for rejection.

As discussed above, a skilled artisan would know, based on the teachings in the present specification, how to make and use the inventive DETX proteins of the claimed invention. In other words, one of skill in the art would know which modifications can be made to the DETX protein or nucleic acid encoding the protein, according to the specification at pages 10-11 and based on the teachings in Table 2. Indeed, Table 2 specifically provides residues which are potential glycosylation and phosphorylation sites and a skilled artisan would recognize which sites can then be changed within the claimed sequences based on this disclosure.

Additionally, since DETX activity can be readily assayed by techniques known in the art and in the specification, modifying the claimed sequences to preserve detoxification activity is enabled by the present application. In fact, the examples further provide that an assay measuring β-galactosidase activity is proportional to the activity of DETX in the sample and therefore, a skilled artisan could readily assess the functional activity of the a protein that shares at least 95% sequence identity to the claimed sequences. Contrary to the examiner's assertions, such experimentation would not be undue.

The examiner also mentioned a sequence which shares 99% sequence identity to SEQ ID NO: 1 and stated that "a 1% difference or change in the sequence identity...completely changes the functionality of the polypeptide from being a calcineurin inhibitor to a human detoxification protein." Office action at 7. However, there is no indication that the sequence in the cited reference does not also have detoxification activity. In other words, a protein may

act as a phosphatase inhibitor as well as an agent in detoxification; the two functions are not necessarily mutually exclusive.

Further, applicants are not merely claiming a sequence that shares at least 95% sequence identity with SEQ ID NO: 1, but a polypeptide that shares at least 95% sequence identity ***and*** has detoxification activity. Accordingly, withdrawal of this ground for rejection is respectfully requested.

IV. Rejection of Claims Under 35 USC § 112, Second Paragraph

Claims 3-7, 9, 11 and 63-66 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. In particular, the claims were rejected because "it is unclear what the meaning of [detoxification activity] is." Office action at 8.

Applicants respectfully assert that one of skill in the art would know what is meant by detoxification activity. For example, the present specification states that "[d]etoxification is the metabolic conversion of pharmacologically active, often toxic molecules to less active molecules." Specification at 1. Further, the application describes examples of detoxifying enzymes, such as ROS detoxifying enzymes, and enzymes involved in the detoxification of lipid soluble drugs and various metabolites, and enzymes in the cytochrome P450 family. Thus, the term "detoxification activity" is clear.

V. Rejection of Claims Under 35 USC § 101

Claims 3-7, 9, 11 and 63-66 were rejected under 35 U.S.C. § 101 because "based on reasonable sequence homology, the polypeptide of SEQ ID NO: 1 is sought to be a human detoxification protein (DETX) which is a generic asserted utility" and "[e]ven accepting the plausible utility of being a human detoxification protein, one of ordinary skill in the art would not know which compounds are detoxified by the polypeptide." Office action at 9-10. Applicants respectfully disagree.

The specification describes that the present invention discloses human detoxification proteins, referred to collectively as DETX and that these proteins have detoxification activity.

As stated in the application, detoxification is the metabolic conversion of pharmacologically active molecules to pharmacologically less active molecules. Therefore, the proteins of the presently claimed invention have an asserted utility.

The specification describes detoxification enzymes which are known in the art and not all detoxification enzymes have the same substrate or mechanism. Moreover, as previously stated, the USPTO does not require applicants to describe the mechanism by which a given compound acts for a showing of utility. All that is required is that the composition is useful or operative. As discussed above, the present specification describes that the DETX methods and compositions of the present invention can be used to treat or prevent certain disorders. Thus, the utility requirement for the claimed invention has been met.

Accordingly, withdrawal of this ground for rejection is respectfully requested.

VI. Double Patenting

Claims 3-7, 9, 11 and 63-66 were rejected under the judicially created doctrine of double patenting over claims 1-13 of U.S. Patent No. 5,524,819. Applicants thank the examiner for holding the rejection in abeyance until there has been an indication of allowable subject matter.

In view of the foregoing arguments, it is respectfully requested that the present rejections be withdrawn.

CONCLUSION

Reconsideration of the present application in view of the foregoing amendments and arguments is kindly requested.

It is respectfully urged that the present application is now in condition for allowance. Early notice to that effect is earnestly solicited.

Examiner Saidha is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application

Respectfully submitted,

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